~~MEANS OF~~ METHOD AND SYSTEM FOR CATEGORIZING ELECTRONIC COMMUNICATION ~~BASED ON SENDER INITIATED CATEGORY NEGOTIATION~~

5   CROSS-REFERENCE TO RELATED APPLICATIONS

[0001]   This application is a non-provisional version of U.S. provisional application No. 60/319,951 filed Feb. 17, 2003.

BACKGROUND OF INVENTION

10   ~~This invention pertains to the exchange of electronic information, and more specifically to an email-like exchange wherein the categorization of information being exchanged is more easily controlled and exposed. This invention pushes the responsibility for message management to the sender of the message, as opposed to the recipient, but under rules imposed by the recipient.~~

15   ~~SUMMARY OF INVENTION~~

[0002]   The growth of the Internet has lead to an ever-increasing amount of unstructured communication. This communication is largely accomplished via email and instant messaging systems, as well as, to a smaller extent, ftp or similar means. The increase in information has lead to an increase in the amount of time a user spends sorting and organizing their communication
20   information.

[0003]   Existing email systems can be characterized as being a one-way broadcast of information having both a sender and a receiver. The sender composes the message and provides some indication as to the nature of the message in the header line. The receiver categorizes email he receives based upon the senders name, keywords in the header line or message, or more
25   sophisticated tools for identifying spurious email. Email is non-real time and asynchronous (from the viewpoint of a human); the receiver does not have to read the email immediately, nor do they need to respond.

[0004]   Instant messaging is real-time and synchronous. Here there is a dialog (back and forth) requiring a timely response. Instant messaging, like human dialog, tends to first establish the
30   context of the interaction (what the conversation is about), and then proceed to a more

meaningful exchange of information. This should be contrasted with an email broadcast where the context (categorization) is largely established on the receiving end.

SUMMARY OF INVENTION

[0005]   This invention pertains to the exchange of electronic or digital information, and more specifically to an email-like exchange wherein the categorization of information being exchanged is more easily controlled and exposed. This invention pushes the responsibility for message management to the sender of the message, as opposed to the recipient, but under rules imposed by the recipient.

[0006]   ~~There exists~~The invention attempts to address a need~~, therefore,~~ for a non-real time, asynchronous communications system with the advantages of negotiating a context. Because of the asynchronous nature of the system, an interactive dialog between a sender and a receiver to set the context ~~setting must be done by something other than dialog (~~ may not be possible as the receiver may not be available~~)~~. To address this difficulty, either the context ~~is~~ can be transmitted in a more structured form (perhaps relying on a-priori information about the receiver) to facilitate automated context setting, or the context ~~is~~ can be negotiated between an agent for the sender and an agent for the receiver, or a third party can negotiate the context between an agent for the sender and an agent for the receiver.

[0007]   In one aspect of the invention, there is provided an electronic system for exchanging messages among users of the system. The system includes a sender agent for transmitting a message from a sender to a receiver and a receiver agent for receiving the message. The sender agent has access to a listing of public categories that is recognized by the receiver agent. The sender and/or the sender agent and the receiver agent negotiate a category based on the listing of categories and associate the category with the message.

[0008]   In one feature of this aspect of the invention, the negotiated category either belongs to the listing of categories, is mapped from a second category belonging to the listing, or is a new category added to the listing. In another feature of the aspect of the invention, the system includes a storage module that stores or indexes the stored messages according to categories associated with each messages. Optionally, the system can include an intermediary agent, wherein the listing of categories is provided to the sender agent through the intermediary agent.

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Conveniently, the system can include several intermediaries, each providing a subset of the listing.

[0009]   In another aspect of the invention, there is provided a system for classifying messages transmitted by a message exchange system. The message exchange system includes a sending subsystem for transmitting a message from a sender to a receiver and a receiving subsystem for receiving the message. The message classification system includes a negotiation module, which includes an agent for the sender and an agent for the receiver. A listing of categories is maintained by the negotiation module. The sender agent and the receiver agent negotiate a category to be associated with the message on behalf of the sender and the receiver.

[0010]   In yet another aspect of the invention, there is provided a method of transmitting a message to a receiver for a sender in a message exchange system. The sender has a sender agent for sending the message and the receiver has a receiver agent for receiving the message. The sender agent has access to a listing of categories recognized by the receiver agent. According the method, the sender agent obtains a destination address from the sender for identifying the receiver and the receiver agent, receives information from the sender to be included in the message, negotiates a category with the receiver agent based on the information received and the listing of categories, associates the category with the message, and then transmits the message to the receiver agent, the message being associated with the category.

[0011]   In other aspects the invention provides various combinations and subsets of the aspects described above.

BRIEF DESCRIPTION OF DRAWINGS

[0012]   For the purposes of description, but not of limitation, the foregoing and other aspects of the invention are explained in greater detail with reference to the accompanying drawings.

[0013]   FIG. 1 shows a general electronic mail system, at the levels of user actions and agent actions.

[0014]   FIG. 2 shows an electronic mail system with the addition of negotiation for the context of the message.

[0015]   FIG. 3 abstract FIG. 2 into major components.

[0016]   FIG. 4 shows the present invention with an intermediary helping to negotiate the context for the message.

[0017]   FIG. 5 shows the system with messaging gateways.

[0018]   FIG. 6 shows the system with multiple recipients of a message.

[0019]   FIG. 7 shows the combination of multiple recipients and an intermediary.

[0020]   FIG. 8 shows the use of multiple intermediaries.

[0021]   FIG. 9 shows a ~~users~~user's view of the context setting system.

[0022]   FIG. 10 shows a ~~users~~user's view of the context setting system when multiple recipients are involved, and all recipients have the same context.

[0023]   FIG. 11 shows a ~~users~~user's view of the context setting system when multiple recipients are involved and each recipient has a different context.

DETAILED DESCRIPTION

[0024]   The description which follows and the embodiments described therein are provided by way of illustration of an example, or examples, of particular embodiments of the principles of the present invention. These examples are provided for the purposes of explanation, and not limitation, of those principles and of the invention. In the description which follows, like parts are marked throughout the specification and the drawings with the same respective reference numerals.

[0025]   ~~An agent is~~As used throughout this specification, the term "agent" refers to an automated system that, once configured by a user, has some independence of action. An intelligent agent may change its behavior over time based upon its interactions with other users and/or other agents. An agent may be distributed or local, autonomous or controlled. Thus, for our purposes, an agent ~~is~~ can be any software system~~.~~ , or a combination of software and hardware (or firmware) systems. It is further understood that where the reference is made to a software system, the software system is residing in any computer readable medium, such as a magnetic storage medium, a CD-ROM, or a computer memory device, i.e., stored on any such readable medium, and/or is executing on any suitable hardware, such as a general purpose computer or a dedicated computation device.

[0026]   ~~At the core of this invention is~~A sender of a message has the increased responsibility ~~of the sender of a message~~ to categorize information being sent out. At the time that communication is initiated, the sender has more information about the context that n the receiver. This information is valuable, and should be used to help the receiver categorize the communication in more than an ad-hoc, post receipt, manner (such as reading the subject line, or scanning for keywords). Instead, both the sender's and ~~receivers~~ the receiver's preferences for categorization should be unified as the message is composed and sent, so that it is properly indexed for all users.

[0027]   The knowledge representation of context or categories will not impact the current invention, as long as that representation has a means for unifying two of more categories. For example, in a generic knowledge representation framework, unification may consist of finding the smallest subset that contains all categories. In a neural network, unification may consist of inserting all categories as the inputs to the neural network and then recording the output value. The knowledge representation structure may be distributed or local or both. The current invention is independent of this representation. It does, however, assume the existence of a categorization structure.

[0028]   The present invention provides a communications system with the advantages of negotiating a context or category to be associated with outgoing messages and a method implemented by the system. As an example, a communications system, such as an e-mail system, generally includes a sending subsystem for sending outgoing messages for a sender and a receiving subsystem for receiving messages on behalf of a receiver. The sending subsystem can include a user interface. A sender can categorize an outgoing message, namely, to associate a category with the outgoing message through the user interface. The category is one that is acceptable to the receiver, such as one that is recognized by the receiving subsystem. Alternatively, the sending subsystem includes a negotiation unit that communicates with the receiving subsystem to identify a category and associate the category with the message. The negotiation between the sending subsystem and the receiving subsystem identifies a category that is acceptable to or recognized by both the sender and the receiver. The category may be selected from a list of categories provided by the receiver or receiving subsystem, or one mapped from a member of the list of categories. When identifying the category, the sending subsystem

can use information about the receiver, such as how the receiver categorizes information, whether the receiver wishes to receive certain categories of information, or even presents information about the receiver.

[0029]   The sending subsystem can also negotiate with an intermediary for the receiver, or through an intermediary for the sender with the intermediary for the receiver, to categorize the message so that the category is acceptable to both the receiver and the sender. Optionally or alternatively, the sending subsystem can negotiate with an intermediary and the receiving subsystem concurrently and unify the results of negotiation with both. Either the sending subsystem or the receiving subsystem, or the sender or receiver intermediaries, can select other intermediaries. Either the sending or the receiving subsystem can also include a search unit for searching and identifying such intermediaries.

[0030]   Either or both sending and receiving subsystems may have a storage unit. Outgoing and received messages, categorized by the system, can be stored based on the associated categories. For example, messages associated with the same category can be stored together, separate from messages associated with another category. The messages can also be indexed based on categorization. This facilitates the later retrieval of messages. The categorization based storing and indexing of messages allows for intelligent filing of messages.

[0031]   As another example of categorization based classification of messages, a negotiation subsystem can be provided within a communications system for classifying outgoing messages. Outgoing messages are categorized, namely each message having a category associated therewith. The negotiation subsystem can include an agent for a receiver and an agent for a sender. The sender agent of the negotiation subsystem negotiates with the receiver agent to identify a category that is mutually acceptable to both the sender agent and the receiver agent. For example, the category may be selected by the sender agent from a list of categories provided by the receiver agent, or one mapped from a member of the list of categories. The negotiation subsystem can be configured so that the sender agent automatically negotiates a categorization with the receiver agent, or it can be configured so that the negotiation is guided with input from the sender. The negotiation subsystem can also include an intermediary agent for automatically mediating the categorization between the sender agent and the receiver agent, or between the sender and the receiver agent.

[0032]   FIG. 1 shows a generic email application. Component 102, which we call the Sender, comprises of the user actions of deciding who the message will be sent to, the subject of the message, the body, and the send command. The send command results in the transfer of the message, 104, through the network, 110. 104 is intended to capture the standard Internet protocol

5   for addressing and delivering a message, or any other means of finding the receiver and delivering a message. The Receiver Agent, 106, typically filters unwanted email, runs email rules to file messages, and then stores the message. The human Receiver, 108, then reads and potentially files the message. Here we see the difference between an Agent, which runs independently and asynchronously, from the Receiver, which is user controlled.

10   [0033]   FIG. 2 shows the fundamental innovation of this invention; it shows the change required in one embodiment for the Sender to categorize a message. There is either a simple or complex interaction between the Sender and a Sender Agent. Before, during or after a message composition, the Sender Agent must negotiate, 210, the categorization of the message with the Receiver Agent, 206, which has been modified with the ability to negotiate, 216. This negotiation

15   occurs over the network, 110, using any type of communication scheme, 214. The Receiver negotiation and categorization will be based upon some knowledge of the recipients desires and/or file structure and may be influenced by the filtering or rules, 220, that the receiver has in place. The categorization may be based upon any type of knowledge representation. As will be described later, during a negotiation, the Receiver Agent or an intermediary provides the

20   knowledge of the receiver, such as how the receiver categorizes information, to the Sender Agent, based on which the Sender Agent determines a suitable category. The suitable category may be one selected from a list of categories provided by the Receiver agent or, if the Receiver Agent allows creation of a new category by the Sender Agent, a new category created by the Sender Agent and then shared by both the Sender Agent and the Receiver Agent. In other words, a

25   suitable category is one that is recognized or accepted by both the Sender Agent and the Receiver Agent, a "common ground" between the sender's expectation of categorization and the receiver's categorization.

[0034]   The senderssender's categorization may be influenced not only by the receiver, but also by information in the body or subject, 220, as well as any type of knowledge representation

30   of the senders preferences. Thus, FIG. 2 shows the new interplay in the composition of a message

which puts some of the responsibility for categorization on the sender and the Sender Agent. As shown in FIG. 2, in one exemplary process, Sender Agent first receives from Sender a receiver's address, extracted from the "To:" field of a message. The Sender Agent then initiates the process and communicates with a Receiver Agent for the receiver so identified. A category may be negotiated and determined at this time. As the sender enters more information, such as "Subject" or body of the message, the Sender Agent can use the additional information to update the category negotiated or start negotiate a new category based on the additional information. As shown in FIG. 2, this negotiation 210 is between the Sender Agent and the Receiver Agent over the Network 110, using any type of communication scheme 214.

[0035]   This new view of electronic dialog is shown in FIG. 3, where the Sender, 102, the Sender Agent, 218, the Network, 110, the Receiver Agent, 206, the Receiver, 108, and the methods of communication, 104 and 214, are all pictured. From hereon we will use 104 as a proxy for both 104 and 214 under the assumption that the same underlying protocol is used for both negotiation and delivery. This should not in any way restrict the current invention from cases where the two methods differ.

[0036]   Implicit on both the sender and receiver sides is a representation of applicable categories, such as a listing of categories, as well as, potentially, the ability for learning of categorization, or even the ability for the sender to update the receivers categorization and/or knowledge representation. In FIG. 4 we generalize this idea to include an intermediary Agent, 402. This agent may have knowledge of general categorizations with a world view, or an enterprise view, for example. The Sender Agent, and therefore the sender, can interact with the Intermediate Agent over link 404, and the Receiver Agent, and therefore the Receiver, can interact over link 406. These communications are in addition to, not to the exclusion of, link 104. In this case the negotiation for a proper categorization is three way. The Intermediary may use a standardized set of categories, or reflect an industry viewpoint. Either the Sender or Receiver can nominate an intermediary.

[0037]   In FIG. 5 we show that gateways can be either transparent to, or participants in, a categorization. The Sender Gateway, 502, and the Receiver Gateway, 504, may be categorization agents in their own right or they may simply pass information. An example of participation would be enterprise based filtering of some content types (humor, pornographic material).

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[0038]   FIG. 6 shows the system with multiple receivers, 108 and 608, as well as receiver agents, 206, 606. Two receivers have been shown, although in general any number can be addressed, shown by ". . ." 602. The categorization procedure in this case can occur between the Sender Agent directly with each recipient, 104 and 604, resulting in potentially different categories for each user, or the Sender Agent may unify the category for both recipients based on negotiation with both.

[0039]   FIG. 7 generalizes FIG. 6 to the case where there is an intermediary agent. In this case communication is possible between all of the parties, adding links such as 706.

[0040]   FIG. 8 generalizes once more to multiple intermediaries and the question of who controls the interaction becomes prevalent. Again, either a sender or receiver can nominate an intermediary, meaning that each receiver may nominate a different intermediary. As long as the intermediaries can all access one another, the unification of the categorization can proceed. As the Sender is the only endpoint with access to knowledge of all intermediaries (under the assumption that multiple recipients have no knowledge of each other for example in the case of blind carbon copies), the management role falls to the sender. If the sender nominates an intermediary, it can also pass on the address of other intermediaries, so the intermediaries can negotiate at one layer removed from the sender and receiver, for example agent 802 over line 808 and 806.

[0041]   This reflects the preferred embodiment of category negotiation.

[0042]   FIG. 9 reflects one possible user view of the interaction. Here a message is being sent to Jane Doe, 904, and 904. Categorization information, for example in the form of a list of categories known to the receiver, has been presented for selection in drop-down by the sender in dropdown list 906 and sub menu 908. Behind the scenes the Sender Agent, given the information jane.doe@biz.com, 904, was able to negotiate these categories with the receiver agent for Jane Doe. As an interactive example, the sender has traversed traverses the categories to "personal" in 906, and retrieved s the submenu 908. Within 908 there are three active subcategories, and one inactive one. The sender can select an active category and complete the negotiation process. The inactive category, "General", indicates that Jane has a Personal. General category, but that it is not available to this sender. However, Jane also has a "(New)" category, meaning that she is willing to negotiate (herself or through her agent) a new category for this sender . Such a

category may only be exposed to this sender, not others, or it may be made public and available for all. ~~We also see in 906 a category for~~ " The sender can also use the "(New)" category to create a category to be associated with the message and complete the negotiation process. We also see in the dropdown list 906 a category for "Biz Projects" which has company specific

5   categories in it . These categories may be driven by an enterprise intermediary, and can be consistent across all Biz employees. A selection of a category would result in a reflection of the selected data in the to field, 918.

[0043]   FIG. 10 shows the same view where multiple recipients are named. In this case a category, "Humor.Clean", 1018, has been negotiated and applied to both users. As will be

10   understood, the category "Humor.Clean" is not restricted to be applied to only two users. It may be applied to more users as well. FIG. 11 shows where different categories have been assigned to different recipients, ~~1118.~~ 1118, which provides an example of mapping one category in one user's list of categories to another category in another user's list of categories.

[0044]   These interfaces are presented for description only and could be developed in many

15   different ways. In particular, categorization may not occur until after the subject field is filled, 910, the body is filled, 912, or the send button pressed, 914. The first two of these may provide more information to the categorization process for example, keywords in the subject. Further, the view of the category may not be in the "to:" field, but may be in the subject field or the body, or even as an attachment, hidden or not.

20   [0045]   Further, as will be appreciated, although an example of interactive categorization through the user interface is described here, the system can be configured to automate the categorization process so that the sender agent automatically negotiates a category with the receiver agent. Different means may be provided for configuring the sender agent, the receiver agent, the negotiation subsystem or the system as a whole to automatically negotiate a category,

25   or allow a user's participation in the negotiation of categorization. For example, interactive menu selection through a user interface may be provided for configuring a sender agent or receiver agent. Other means are also possible, including use of system configuration parameters, command line options or any other suitable means, as known to those skilled in the art.

[0046]   Of course, the categorization allows for intelligent ~~filling~~filing, such as in category-based folders or with category-based indexing, of sent messages, as well as received ones.

[0047]   Presence information (such as whether a user is online, whether they are accepting messages, whether they want to be involved in categorization) can also be used to guide the system.

[0048]   ~~Therefore, this description is merely illustrative, and the present invention is defined solely by the claims that follow and their full range of equivalents~~Various embodiments of the invention have now been described in detail. Those skilled in the art will appreciate that numerous modifications, adaptations and variations may be made to the embodiments without departing from the scope of the invention. Since changes in or additions to the above-described best mode may be made without departing from the nature or scope of the invention, the invention is not to be limited to those details provided for illustration but only by the appended claims.